

## A REVISION OF THE AUSTRALIAN BOMBYLIIDAE (DIPTERA). III.

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### Subfamily SYSTROPINAE.

Head about as broad as the thorax; occiput never raised, bilobate above or with a central cavity; eyes with the hind borders entire, contiguous in both sexes (*Systropus*), or separated in the female only (*Dolichomyia*). Antennae approximate at the base, rather long in *Systropus*. Proboscis slender and porrect, at least as long as the head; palpi slender, consisting of one segment. Thorax greatly arched with a conspicuous development of the metasternum; bristles almost absent; scutellum small, semicircular in shape. Abdomen elongate and usually pedunculate. Legs with the hind pair greatly elongated, the hind femora and sometimes the tibiae swollen apically. Wings short and narrow, devoid of an alula and with a greatly reduced lobe; M with two branches only; cell Cu closed.

This subfamily is represented in Australia by two genera, *Systropus* and *Dolichomyia*. Nothing is known in this country of the life histories of any of the species, but in Africa and America species of *Systropus* have been bred from moths of the Limacodidae and Notodontidae.

#### Key to the Genera of the Systropinae.

1. Large flies with the eyes in both sexes contiguous; abdomen swollen apically and decumbent in both sexes ..... *Systropus* Wied.
- Small flies with the eyes contiguous in the males only; abdomen in the males but slightly swollen apically, the apex upraised, in the females usually broadest medially and decumbent ..... *Dolichomyia* Wied.

#### Genus SYSTROPUS Wiedemann.

*Nov. Dipt. Gen.*, 1820, 18; Hardy, *Proc. Roy. Soc. Tasm.*, 1921, 61.

Genotype, *S. macilentus* Wied. (Sth. Africa).

Head as broad as or broader than the thorax; occiput concave, bare; ocellar tubercle rounded, prominent, and placed at the head vertex; eyes closely contiguous in both sexes, reaching from the top to the bottom of the head, the facets small and of uniform size; frons small, reduced by the contiguous eyes, bare; face small between oral margin and antennae, extending as a thin strip to the cheeks. Antennae porrect, longer than the head, the first segment long and cylindrical, the second not quite half the length of the first, also cylindrical in shape, the third flattened, pointed, and about half as long as the first. Proboscis very long and thin, porrect; palpi slender, short.

Thorax strongly arched, sculptured, with a little thin pubescence and no spines; metasternum much developed; scutellum small, raised, devoid of spines. Abdomen very long and pedunculate, consisting of eight visible segments, the apical segments clubbed in both sexes; genitalia small; clothed with sparse hairs.

Fore and middle legs comparatively short and thin; hind legs very long and strong, stretching well beyond the tip of the abdomen, the femora somewhat clubbed at the apices, and with the tibiae, provided with a few short spines; pulvilli present but weak.

Wing, typical of the subfamily, i.e., the lobe is much reduced, the alula is missing, and M has only two branches; cell Cu closed.

*Range*.—Africa, Asia, North and South America, and Australia.

The genus contains but two species in Australia, both described as new and confined to Queensland, extending from Brisbane to Cairns.

*Key to the Species of Systropus.*

1. Black and yellow species with the apex of the abdomen black .... *flavo-ornatus*, n. sp.
- Black and brown species with the abdomen uniformly brown ..... *doddi*, n. sp.

*SYSTROPUS FLAVO-ORNATUS*, n. sp.

♂. Head silver-grey; eyes approximate near the ocellar tubercle, contiguous for a short distance near the antennal triangle; frons dark, with a median vertical groove extending from near the base of the antennae to meet a deeper transverse groove at its middle; face small, yellowish, silver-grey from above, extending as a thin strip to the cheeks. Antennae about twice the head length, the first segment yellowish with the apex black, second and third segments black, the first two segments with short black hairs, the third with minute hairs of the same colour. Proboscis black, about twice the head length; palpi short, brownish, about one-fourth the length of the proboscis.

Thorax rugosely punctate, deep black, with yellow lateral margins, the black gradually broadening from the scutellum to the head to form two large rounded shoulders, from thence continuing to head as a much narrower neck; the yellow margins are interrupted on each side by a black band reaching to the wing insertions; propleurae yellow, meso-, ptero-, and sternopleurae black, hypopleurae black, stained yellow adjacent to the coxae; metasternum yellow, greatly developed; scutellum black, with a rounded, median, yellow area; halteres elongate, brownish with yellow knobs.

Abdomen much compressed apically, with the apical club well developed; first segment yellow with a broad, black band, which appears continued dorsally as a faint stripe; apical segments black, remaining segments yellow; ventrally and laterally there are two narrow black stripes, interrupted at the borders of each segment; genitalia apparent as one or two small black spines.

Fore legs uniformly yellow with the apical tarsi brown; middle legs with the coxae black, the femora yellow, sometimes with the basal two-thirds blackish; the tibiae yellow, with short black spines, and the basal tarsi yellow; hind legs with the coxae black, the clubbed apices of the elongate femora black, otherwise the femora are yellow, tibiae yellow with the median third black; tarsi black, the whole with numerous, short, black spines; pulvilli brownish.

Wings greyish hyaline, lightly fuscous at the base and along the fore border. Holotype ♂, Westwood, Central Queensland, February, 1927, A. P. Dodd, allotype ♀, Westwood, A. N. Burns, 15th January, 1925. Length of body: ♂, 24 mm., ♀, 22 mm.; of wing: ♂, 12 mm., ♀, 11 mm.

The female is similar to the male and can be distinguished only by the genitalia which are usually exerted.

There are eight paratypes (4 ♂, 4 ♀), collected by Mr. A. P. Dodd on a small flowering shrub at Westwood in February, 1927.

The holotype and allotype are in the Queensland Museum.

*SYSTROPUS DODDI*, n. sp.

♀. Head grey; eyes contiguous for a short distance below the black ocellar tubercle; frons dark grey, with a median vertical and a transverse groove as in *flavo-ornatus*; face small, greyish, extending as a thin strip to the cheeks. Antennae about twice the head length, the first segment black, yellow at base, the second and third black, all with short black hairs, those on the third segment being very minute. Proboscis black, long and slender; palpi small, yellow.

Thorax as in *flavo-ornatus* except that the yellow colour is replaced by brown; halteres with brownish knobs. Abdomen much compressed apically, the apical club well developed; the basal segments yellowish turning to brown apically; basal segment with a black band which is continued dorsally as a dark, indistinct stripe; ventrally and laterally there are two narrow black stripes, interrupted at the hind border of each segment. Fore legs yellow with the apical tarsi brown; middle legs with the coxae blackish, the femora and tibiae yellowish-brown; hind legs with the femora brownish, the apical third yellow, the tibiae and tarsi black; pulvilli brownish.

Wings greyish, the base and fore margin lightly fuscous.

Holotype ♀, Stradbroke Island, Queensland, H. Hacker, 5th December, 1913. Length of body, 25 mm.; of wing, 12 mm.

The male is unknown. Four paratype females are before me, 2 ♀, F. P. Dodd, Kuranda, North Queensland, March, 1927; 1 ♀, A. P. Dodd, Cairns, and 1 ♀ unlabelled.

The holotype is in the Queensland Museum.

Genus *DOLICHOMYIA* Wiedemann.

*Aussereurop. zweifl. Ins.*, ii, 1830, 642; Hardy, *Proc. Roy. Soc. Tasm.*, 1921, 61. Genotype, *Dolichomyia nigra* Wiedemann.

Head somewhat globular, about as broad as the thorax; occiput concave above, convex below; eyes large, contiguous in male, separated in the female; frontal triangle small; face small, extending as a thin strip to the cheeks; ocellar tubercle large, rounded and prominent. Antennae not as long as head, the first segment cylindrical, the second about half the length of the first, the third about as long as the first, compressed and apically pointed. Proboscis at least as long as the head, porrect and somewhat slender; palpi slender, usually rather long.

Thorax much arched, of great depth, clothed with sparse hairs; scutellum small, semicircular in shape; squamae minute; halteres elongate, with much enlarged knobs. Abdomen long and slender, the apex upraised in the male and slightly clubbed; in the female, it is laterally compressed, decumbent and usually broadest medianly; genitalia complex. Fore and middle legs short, hind legs very long and strong, apices of femora clubbed and usually armed ventrally with two rows of short, strong spines; tibiae also sometimes with apices clubbed; pulvilli weak.

Wings short and narrow, typical of the subfamily; the costa is continued right round the wing; Sc and R<sub>1</sub> are contiguous for a distance, so that the cell Sc is much reduced; R<sub>2+3</sub> at most but little curved; M with only two branches; mc somewhat acute at base; 1A is straight and meets Cu, at the wing margin.



Range.—Europe, North America, and Australia.

Three species are known, two of which are regarded as new. Hardy's *clavifemoratus* is known from both New South Wales and Queensland, *occidentis* from Western Australia and Queensland, whilst *minima* appears to be confined to the latter State.

*Key to the Species of Dolichomyia.*

1. Very small species with the cubital fork of the wing rather broad, i.e.,  $R_4$  is straight and meets the margin well distant from  $R_5$  ..... 2  
 Larger species with the cubital fork narrow, i.e.,  $R_4$  is curved and meets the margin not so distant from  $R_5$  ..... *clavifemoratus* Hardy.
2. Humeral angles yellow, abdomen with brownish lateral markings; tibiae with apical half little swollen ..... *minima*, n. sp.  
 Humeral angles black, abdomen with grey lateral markings; tibiae with apical half greatly swollen ..... *occidentis*, n. sp.

*DOLICHOMYIA CLAVIFEMORATUS* Hardy.

*Systropus clavifemoratus*, Hardy, *Proc. Roy. Soc. Tasm.*, 1921, 61, pl. xvii, figs. 16, 17, 18 and 19.

♂. Head dark grey; occiput grey, clothed with sparse white tomentum and bearing a row of minute bristles; eyes approximate near the black ocellar tubercle, contiguous near the antennal triangle. Antennae short, about half the length of the head, black, typical of the genus. Proboscis black, about as long as the head, porrect; palpi dark, reaching to the upturned portion of the proboscis. Face between antennae and oral margin small, extending as a thin strip to the cheeks.

Thorax dark grey, with two indistinct black, admedian stripes and a black lateral ridge; pleurae grey separated from the grey of the thorax by a narrow black stripe, the whole clothed with very sparse white pubescence more apparent on the mesonotum; scutellum black; halteres brownish. Abdomen black with grey lateral markings and a grey venter; each segment is narrowly bordered posteriorly by yellow. Fore and middle legs brownish-yellow, with grey coxae and stained fuscous at the base and on the tarsi; hind legs with the coxae grey, the hind femora black, with usually the apical third swollen, with a ventral yellowish mark at the base of this swollen part, and provided with two rows of about ten short, black spines; tibiae yellow with the base and apex broadly black; tarsi black; pulvilli yellowish.

Wings hyaline and glistening;  $R_4$  curved.

The female is similar except for the abdomen and the separated eyes.

*Hab.*—Queensland: Brisbane (September), Chinchilla (October), Westwood (February); New South Wales: Blackheath (November), Kosciusko (February).

Of the twelve specimens under examination, six agree with Hardy's description, except that the segments of the abdomen possess a narrow yellow hind border. The absence of this character in the type was possibly due to the telescoping of the segments. In the other six the clubbed portion of the hind femora varies to one-half the length, becoming somewhat broader. In three of these specimens the markings of the abdomen tend to a brown colour. It is possible that more than one species is represented by this series, but at the present time I am unable to detect any definite characters for their separation, and have had to be content with regarding *clavifemoratus* as being somewhat variable.



*DOLICHOMYIA MINIMA*, n. sp.

♂. Head grey; occiput grey with sparse whitish pubescence; eyes approximate near the ocellar tubercle, contiguous near the antennal triangle. Antennae about one-half the length of the head, the first two segments greyish, the third black, typical of the genus. Proboscis black, about as long as the head; palpi slender, reaching almost to the upturned portion of the proboscis; face and frons small, the face extending as a thin strip to the cheeks.

Thorax dark grey or blackish, the humeral angles yellow, clothed with short, sparse, pale hairs; pleurae grey, also with sparse pale hairs; scutellum black; halteres brownish with yellow knobs. Abdomen elongate and slender, the apex upraised and slightly clubbed; shining black, with brownish lateral markings and venter. Fore and middle legs yellowish, the coxae of the fore legs dark, and the apical tarsi of both, brown; hind legs with the coxae dark, the femora with the broadly clubbed apical third black, otherwise yellow with a fuscous streak extending dorsally from the base to the black club; a double row of about twelve short, strong, black spines beneath; tibiae slightly clubbed apically, yellow with the apical third black; tarsi black; all pulvilli yellow.

Wings hyaline;  $R_1$  not curved and meeting the wing margin some distance from  $R_5$ ; cell mc rather acute at base.

The female, except for the separated eyes and the differently shaped abdomen, agrees with the above description in every respect.

Holotype ♂, Chinchilla, Queensland, October, 1926, B. Smith; allotype ♀, Waroo, Southern Queensland, February, 1928, G. H. Hardy. Length of body: ♂, 5 mm., ♀, 6 mm.; of wing: ♂, 3.5 mm., ♀, 4 mm. Paratypes: 1 ♂, Gravesend, N.S.W., 10th January, 1929, A. P. Dodd; 2 ♀, Brisbane, 10th March, 1918, H. Hacker; 4 ♂, 1 ♀, Waroo, February, 1928, G. H. Hardy.

The holotype and allotype are in the Queensland Museum.

*DOLICHOMYIA OCCIDENTIS*, n. sp.

♂. Head grey; occiput silver-grey, covered with sparse, rather long, white hairs, which extend to the chin to form a thin beard; eyes contiguous for a distance below the ocellar triangle; ocellar tubercle black, with a few pale hairs. Antennae with the first two segments grey, the third black, typical of the genus. Proboscis slender and black, longer than the head; palpi slender, reaching to the upturned portion of the proboscis. Face and frons small, the former extending as a thin strip to the cheeks.

Thorax dark grey, silver-grey laterally, with two short, admedian black stripes and a narrow black lateral ridge, covered with short and sparse white hairs; pleurae grey with scattered white hairs, more apparent on the mesopleurae; scutellum shining black; halteres pale with yellow knobs. Abdomen black, long and slender with the apex upraised and little clubbed, the segments with rather large and distinct grey lateral markings and narrow posterior yellow borders; venter grey; the pubescence consists of scattered white hairs, more concentrated basally and laterally to form two tufts. Legs with the coxae grey, the fore and middle legs yellowish, the femora at the base and all tarsi, brown; hind legs with the apical third of the femora clubbed and black, the rest of the femora being yellow, black basally and with a brownish streak above; spines apparently wanting; tibiae with the apical half swollen as much as, if not more than, that of the femora, yellowish, the swollen half black; tarsi black; pulvilli yellow.

Wings hyaline;  $R_4$  not curved; cell mc acute at base.

The female is similar in every way to the male, except for the separated eyes and the differently shaped abdomen.

Holotype ♂, Kojarena, Western Australia, 6th September, 1926, A. J. Nicholson; allotype ♀, similar data. Length of body: ♂, 8 mm., ♀, 9 mm.; of wing: ♂, 4.5 mm., ♀, 5 mm. Paratypes: 12 ♂ (same data); 1 ♀, Kojarena, 6th September, 1926, E. W. Ferguson.

Included in the series of this species are eight specimens from Brisbane. All of these agree with the above description, except that in each the hind femora bear two rows of short strong spines below. Not one of the Western Australian specimens gave any evidence of this character, though each was submitted to a very close examination. The species may readily be recognized by the greatly swollen femora and tibiae in conjunction with the clear grey markings of the abdomen.

The holotype and allotype are in the Macleay Museum.

#### Subfamily TOXOPHORINAE.

Eyes large, their hind borders not indented and devoid of a bisecting line; occiput flattened, without any bilobation or central cavity. Proboscis porrect, extending beyond the head; palpi slender and consisting of one segment. Prothorax much developed and beset with numerous strong bristles.

This subfamily in Australia is represented by the one genus, *Toxophora*.

#### Genus TOXOPHORA Meigen.

*Illig. Mag. Insect.*, ii, 1803, 270.

Genotype, *Asilus maculatus* Rossi. (Europe), by Meigen's designation.

Head about as broad as thorax; eyes large, contiguous in male, separated in the female; ocellar tubercle prominent and placed at the head vertex. Antennae porrect, much longer than the head, approximate at the base, the first segment long and slender, cylindrical, the second about half the length of the first, the third apically pointed, not quite as long as the second, and usually provided with a small terminal style. Proboscis about as long as the head, sometimes longer, curved up towards the antennae; palpi long and slender. Frons much reduced in the male by the contiguous eyes; face rather broad.

Thorax strongly arched with a great development of the prothorax, which is provided with strong, curved bristles, the whole clothed with scales; other thoracic macrochaetae well developed; scutellum semicircular in shape, with a few long marginal bristles; halteres slender. Abdomen somewhat cylindrical and decumbent, clothed with scales and a few sparse hairs. Legs of about equal length, with the femora rather long and strong; fore and middle legs with few spines, those on the hind legs numerous and well developed; pulvilli present.

Wings rather narrow, with the lobe somewhat reduced; M with only two branches; cell mc sharply acute at the base; cell  $R_4$  with an interradiial vein; vein  $Cu_1$  curved to meet the vein  $A_1$  before the wing margin.

Range.—South Europe, Asia, North and South America, and Australia.

This genus, which is recorded from Australia for the first time, is represented by one species, *compta*, which is new. Nothing is known of the life history or habits of these peculiar Bombyliidae. They are supposedly parasitic on Hymenoptera. The three specimens representing the species were captured on flowering shrubs.

## TOXOPHORA COMPTA, n. sp.

♂. Head black; occiput black, bearing stiff yellowish hairs; ocellar tubercle black, rounded; eyes approximate near the ocellar tubercle, contiguous to near the antennal triangle; frons much reduced by the contiguous eyes, covered with black scales, yellow haired near the base of antennae; face black, with black scales and a few black hairs, the upper portion of the cheeks with depressed, bright yellow hairs. Antennae black, the first segment yellowish basally, with numerous short black hairs; style small. Proboscis somewhat longer than the head, black, with enlarged black labella; palpi slender, black, about half the length of the proboscis.

Thorax black, covered with dorsal brown and black scales and thin whitish pile, with two bright yellow patches of tomentum on each side of the prothorax; bristles very long and strong, those on the prothorax curved backwards, black; scutellum black, with dorsal black and marginal yellow scales; bristles thin, black; pleurae grey-black with sparse pale pubescence, the mesopleural tuft pale yellow; halteres brownish, knobs yellow; squamae whitish with a fringe of white cilia. Abdomen about as long as head and thorax together, not much narrower at the apex than at the base, covered with black scales, with two yellow bands, the basal band interrupted medianly, and with short yellow hairs at the apex. Legs with the coxae blackish, the fore and middle femora black with the apical third brown; hind femora brown; all tibiae brown, the tarsi darker; the whole with black and brown scales; spines black; pulvilli brownish.

Wings blackish at the base and along the fore margin to the apex and for two-thirds the depth, clearing to the inner margin; costal border brownish.

Holotype ♂, Brisbane, 6th March, 1918, H. Hacker. Length of body, 9 mm.; of wing, 7 mm. The female is unknown. One paratype male exists, captured in Brisbane in October, 1926, by the author. There is another male in the Australian Museum labelled Gayndah, Q.

The holotype is in the Queensland Museum.

## Subfamily CYLLENIINAE.

Head broad; occiput raised, bilobate above, with a central cavity, and with a fringe typically placed at the borders of this cavity; eyes devoid of an indentation of the hind borders and of a bisecting line. Antennae approximate at the base, porrect. Proboscis sometimes longer than the head, the palpi one- or two-segmented. Thorax usually flattened. Abdomen usually somewhat broad and flattened. Legs slender, sometimes with strong spines; pulvilli present. Wings strong; vein  $R_{2+3}$  sometimes looped and recurrent; M with three branches; cells  $R_3$  and  $R_4$  sometimes with interradians.

I have placed two genera here, *Neosardus* and *Myonema*, both of which are new. *Neosardus* is closely allied to the African genera, *Nomalonia* and *Henica*, but may be easily distinguished from either by the much smaller development of the bristles and by the different venation. *Myonema*, except for the absence of the hind indentation and bisecting line of the eyes, bears a close relationship to the subfamily Lomatiinae.

In a note on the subfamily key, given in Part 1 of this series, I placed *Marmasoma* and *Eclimys* in this subfamily, but remarked on the smaller development of the bilobation and central cavity of the occiput. Although both these genera were placed by Bezzi in the Cylleninae, I have since decided, in order to avoid any confusion in following the key, to ally them with the subfamily Phthiriinae.



*Key to the Genera of the Cylleninae.*

1. Cells  $R_3$  and  $R_4$  with interrarial veins; antennae as long as head .. *Neosardus*, n. gen.  
Cells  $R_3$  and  $R_4$  without interrarial veins; antennae very much shorter than the head ..... *Myonema*, n. gen.

## Genus NEOSARDUS, n. gen.

Genotype, *Neosardus principius*, n. sp.

Head broad and shining; occiput inflated, bilobate above and with a distinct central cavity; eyes small, not reaching to the bottom of the head, separated in both sexes; ocellar tubercle large, rounded, and placed at the vertex of the head. Antennae placed above the middle of the head, approximate at base, porrect and about as long as the head; first segment long and cylindrical, second short, about one-third the length of the first, third not as long as the first, somewhat conical in shape, with a blunt apex and provided with a distinct and terminal style. Frons raised, rather broad; face very broad, the cheeks separated from the small and raised oral opening by distinct grooves. Proboscis erect, as long as, or longer than, the head, rather stout; palpi elongate and slender, two-segmented, the second segment about one-third the length of the first.

Thorax somewhat quadrate in shape, rather flattened, clothed with shining scales and bearing thin pre- and post-alar bristles; scutellum semicircular in shape, cushion-like, the margin with thin long bristles; halteres slender; squamae small. Abdomen consisting of seven visible segments, somewhat flattened, as long as, or longer than, the head and thorax together, usually with a truncated tip, and clothed with shining scales and sparse hairs. Legs rather slender, the hind pair elongate; tibiae with rows of spines, more developed on the hind tibiae; middle and hind femora with few and many spines beneath; pulvilli small, weak.

Wings strong with well developed lobes and alulae; vein  $R_{2+3}$  looped, the loop being sometimes a little recurrent; cells  $R_3$  and  $R_4$  each with an interrarial; cell mc sometimes angulated below, the angle sometimes marked with a short appendix; M with three branches; cells  $R_5$  and Cu open;  $Cu_2$  incomplete.

This genus has been erected to include four species, all new, which agree in every respect with the above characters. Its nearest allies are to be found in the African genera, *Nomalonia* and *Henica*, from both of which it may be readily distinguished by the antennae, the less bristly thorax and legs, and by the venation.

*Distribution.*—The records of the few specimens of the four species show that *nigratus* appears confined to Western Australia, *circumdatus* and *lepidus* to New South Wales and *principius* to Queensland and South Australia.

*Key to the Species of Neosardus.*

1. Vein  $R_{2+3}$  recurrent, the loop about as broad as deep, the wings with a broad, black, basal pattern ..... *nigratus*, n. sp.  
Vein  $R_{2+3}$  little recurrent, the loop longer than deep ..... 2
2. Abdomen with yellow posterior borders to the segments; thorax with yellow humeral angles ..... *circumdatus*, n. sp.  
Abdomen at most with narrow brown posterior borders to the segments; thorax without yellow humeral angles ..... 3
3. Small species, the wings with a definite brown pattern, the brown descending as a broad band across the wing, but not reaching the hind margin .. *principius*, n. sp.  
Larger species, the wings brownish, the apex broadly hyaline; no band present ....  
..... *lepidus*, n. sp.

*NEOSARDUS CIRCUMDATUS*, n. sp.

♀. Head shining yellow; occiput with a well marked bilobation and central cavity, covered with short, pale hairs; ocellar tubercle shining black; frons yellow with short yellow hairs; face yellow, the cheeks and chin grey, clothed with soft, short, white hairs. Antennae with the first segment yellow, with short yellow hairs, the second black, with black and some yellow hairs; third missing. Proboscis black, about as long as the head, the labella enlarged; palpi slender, yellow, about one-half the length of the proboscis.

Thorax black, grey laterally, with yellow humeral angles, with traces of greenish scales; pre- and post-alar bristles pale brownish; scutellum brownish-yellow with pale, brown, marginal bristles; pleurae and breast grey with sparse pale yellow and white hairs; halteres yellow. Abdomen shining black, the segments with prominent, yellow, posterior borders; tomentum apparently consisting of greenish scales, short, appressed, brownish hairs and a white basal tuft; venter mainly yellow, the segments with black anterior borders and covered with short, appressed yellow hairs. Legs with the coxae grey, the fore and middle legs light brown with darker apical tarsi; hind legs dark fuscous, the femora below, the apex of the tibiae and all tarsi black; coxae with white hairs, legs otherwise with yellowish scales and weak pale pulvilli.

Wings light fuscous at the base and along the costal border to the apex of  $R_1$ , leaving the lobe and apical half hyaline;  $R_{2+3}$  little recurrent, the loop being longer than deep; cell M with a hyaline spot.

Holotype ♀, Broken Hill, N.S.W., C. Deane; no date. Length of body, 10.5 mm.; of wing, 9 mm. Paratype ♀, data similar.

The specimens are rather rubbed, but the colours are outstanding enough to determine the species.

The holotype is in the Queensland Museum.

*NEOSARDUS LEPIDUS*, n. sp.

♀. Head a shining yellowish-brown; occiput paler below, with a distinct bilobation and central cavity, covered with short pale hairs; ocellar tubercle black, shining; frons shining yellow with black hairs; face yellow between oral margin and antennae, pale on the cheeks, clothed with short pale hairs which are continued to the chin to form a short sparse beard. Eyes typical. Antennae with the first two segments yellowish with short black hairs, the third black with a small but distinct style placed on one side of the broad apex. Proboscis black, as long as the head; palpi slender, yellow, about half the length of the proboscis.

Thorax black, covered with beautiful, green, reflective scales and bearing pale brown pre- and post-alar bristles; scutellum shining brown, black basally, clothed with similar scales, the marginal bristles thin and brown; hairs clothing the thorax sparse and brown; pleurae grey with sparse white hairs, the mesopleural tuft longer and denser; halteres pale brownish, the knobs partly black. Abdomen shining black, brownish on the sides, the apical segments with narrow brown posterior borders, the whole covered with scales, similar to those of the thorax, and with short, depressed, dark hairs; basal tuft white, the hairs being continued on each side of the scutellum, but short and equal; laterally for about half the length the hairs are thin and white; venter greyish with short brownish hairs. Legs with grey coxae, the fore and middle legs brown with black apical tarsi;

hind legs dark brown; coxae with white hairs, tomentum of legs otherwise consisting of pale scales; pulvilli pale; spines short and black.

Wings with the basal half brownish, the apical half hyaline; loop of  $R_{2+3}$  a little recurrent; venation typical.

Holotype ♀, Gravesend, N.S.W., January 1st, 1929, H. Nicholas. Length of body, 10.5 mm.; of wing, 8 mm. Paratypes: 2 ♀, Gravesend, December, 1928, H. Nicholas.

The holotype is in the Macleay Museum.

*NEOSARDUS PRINCIPIUS*, n. sp.

♂. Head grey; occiput with a distinct bilobation and central cavity, with some erect black hairs above and white hairs below, the latter extending to the chin to form a sparse beard; ocellar tubercle shining black. Eyes separated at the vertex by about one and one-half times the width of the ocellar tubercle. Antennae typical, the first and second segments with some short black hairs, the third rather stout; style distinct. Proboscis black, as long as the head; palpi pale yellowish with a few pale hairs. Frons grey, brown from above, covered with erect black hairs; face very broad, grey, but brown between antennae and oral margin, the mouth borders brownish; brown area with short black hairs, the face otherwise covered with sparse white hairs, longer on the chin.

Thorax brownish, grey anteriorly and laterally, clothed in front and on the sides with sparse white pubescence, the dorsum with beautiful, reflective, coppery and green scales; pre- and post-alar bristles thin, brownish; scutellum black covered with similar scales and bearing long, thin, pale, marginal bristles; pleurae and breast grey, with sparse white hairs, more apparent on the mesopleurae; halteres yellowish beneath, brown above. Abdomen black, about as long as the head and thorax together, covered with scales similar to those on the thorax, and bearing short equal white hairs laterally, longer and denser basally from where they reach across the dorsum to form a thin basal band. Legs with the coxae grey; fore legs brownish, the basal half of the femora and the apical tarsi, black; middle legs mainly brown, tarsi darker; hind legs with the tibiae brown, femora and tarsi mainly blackish; tomentum consisting of white hairs on the coxae and pale scales on the femora and tibiae; pulvilli pale.

Wings hyaline, with an irregular brown pattern which is continued along the costal border to a little beyond the apex of  $R_1$  and reaching across the wing as a broad band to colour all cell  $mc$ , the basal portion of cell  $M_1$ , and the adjacent part of the broadly open cell  $Cu$ . The outline is rather irregular, leaving a large hyaline patch in cell 1st  $R_3$ , and colouring one-third of cell  $R_5$ , and the basal third of cell  $M_2$ ; there is a large hyaline area in cell  $M$ ; curve of  $R_{2+3}$  little recurrent;  $R_5$  broadly open; venation typical.

Holotype ♂, Emerald, Q., November 18th, 1928, F. Roberts; allotype ♀, Chinchilla, Q., November 20th, A. P. Dodd. Length of body: ♂, 7 mm., ♀, 8 mm.; of wing: ♂, 5 mm., ♀, 5.5 mm. The female is similar to the male except for the widely separated eyes. Paratypes: 2 ♂, Chinchilla, November 14th, 1927, B. Smith; 1 ♂, Goondiwindi, Q., December 30th, 1927, F. Roberts; 1 ♂, Chinchilla, as in allotype; 2 ♂, Brisbane, November 28th, 1917, H. Hacker.

There are twelve additional specimens in the Macleay Museum from South Australia.

The holotype and allotype are in the Queensland Museum.



## NEOSARDUS NIGRATUS, n. sp.

♂. Head metallic brown; occiput with a distinct bilobation and central cavity, covered with short pale hairs, with some brown scales near the bilobation; ocellar tubercle large and shining black, with some erect, pale yellowish hairs. Eyes small, separated at the vertex by about one and one-half times the width of the ocellar tubercle. Frons shining brown, broad, covered with erect and equal black hairs; face very broad, at its narrowest point about twice the width of an eye, clothed with short, equal, and erect white hairs, which form a somewhat short and sparse beard on the chin, and a few erect black hairs between the oral margin and antennae. Antennae about as long as the head; black, the first segment brownish, the first two segments with short black hairs, the third somewhat elongate-conical in shape and provided with a stout terminal style. Proboscis black, about three times the head length; palpi pale brown, about one-third the length of the proboscis and bearing short sparse hairs.

Thorax black, covered with shining and reflective coppery scales and sparse, erect, black hairs; collar consisting mainly of whitish hairs, denser below; bristles thin and brown; pleurae shining brown, the mesopleural tuft dense, pale brown above, white beneath; halteres pale brown with pale yellowish knobs; scutellum brown, black basally, with tomentum similar to that of the thorax, the margin with thin, brown bristles. Abdomen stout, curved, broader than the thorax, shining black, with a short white basal band, which extends laterally as two white tufts, sparse, erect black hairs, which are densest laterally, and scales similar to those of the thorax. Legs with the coxae and femora blackish, bearing sparse, black and pale hairs; tibiae brown; tarsi black, pulvilli pale.

Wings with the basal half dark brown, the apical half hyaline, the colour extending across the wing to where  $M_{3+4}$  meets the margin and containing two small hyaline spots;  $R_{2+3}$  much looped apically, the loop being about as broad as its depth, the vein recurrent; cell *mc* angulated below, the angle frequently marked by a small appendix;  $R_5$  narrowly open; *r-m* placed a little before the middle of *mc*.

Holotype ♂, Armadale, Western Australia, J. Clark; allotype ♀, data similar. Length of body: ♂, 11 mm., ♀, 10 mm.; of wing: ♂, 10 mm., ♀, 8.5 mm. The female has the eyes more broadly separated and the brown of the wings much lighter, but is otherwise similar to the male. Paratypes: 1 ♂, 2 ♀, also from Armadale and captured by J. Clark.

The holotype and allotype are in the Macleay Museum.

## Genus MYONEMA, n. gen.

Genotype, *Myonema humilis*, n. sp.

Head rounded, about as broad as the thorax; occiput raised, bilobate above, with a large central cavity and with a short fringe at the border of this cavity. Eyes reaching the full height of the head, separated in the male at the head vertex by about half the width of the ocellar tubercle, the hind borders with a well marked concavity; ocellar tubercle large, rounded, placed well below the head vertex, the ocelli large. Face very small between upper mouth borders and antennae, narrowing a little towards the chin. Antennae small, the first segment broad and somewhat cupuliform, the second very small and globular, the third as long as the first and second together, somewhat spindle-shaped viewed from the side, but when viewed from above the inner surface is concave; style

spine-like, apical. Proboscis short and rather stout, hardly longer than the oral opening, the labella enlarged; palpi slender, curled, about half as long as the proboscis.

Thorax longer than broad, almost flattened, covered with erect and appressed pile, the pre-alar bristles evident, but weak; scutellum broad and semicircular in shape; the mesopleural tuft long and dense; halteres rather small and slender; squamae small with a long fringe. Abdomen consisting of seven segments, the eighth with the genitalia, rather narrow, but broadening to the fifth segment, the apical segments decumbent. Legs slender, the femora rather stout; tibiae with spicules, more developed on the hind tibiae; pulvilli present.

Wings rather narrow, the lobe reduced and the alula wanting;  $R_{2+3}$  but little curved at the apex; cells  $R_3$  and  $R_4$  undivided; cells  $R_5$  and Cu open; M with three branches; cell mc about twice as long as broad, the cross-vein r-m placed a little before its middle.

This genus is represented by the one species, all the specimens of which were taken at Brisbane, Queensland. The genus, especially in the shape of the head, with its raised and bilobate occiput and large central cavity, and antennae, bears an affinity to the Lomatinae. The absence of the hind indentation and bisecting line of the eyes makes it at once distinct, although the hind margins are conspicuously concave.

*MYONEMA HUMILIS*, n. sp.

♂. Head greyish; occiput covered with appressed white pile, the fringe at the borders of the central cavity short and white; ocellar tubercle large and black, crowned with erect, black hairs. Eyes separated at the head vertex by about one-half the width of the ocellar tubercle; head between ocellar tubercle and vertex velvety black, with some black hairs. Frons black, grey towards antennae, with black and white hairs, the latter on the grey area; face little projecting between the eyes, covered with dense whitish or pale brownish pile; chin with a soft, white beard. Proboscis black; palpi with the basal two-thirds black, the apical third brown, with sparse pale hairs, longest basally. Antennae with the first two segments with long white hairs below and with intermixed black, laterally.

Thorax black, the prescutellar suture greyish, covered in front and on the sides with erect whitish pile and dorsally with appressed white tomentum and erect black and white hairs intermixed; bristles brown; mesopleural tuft somewhat yellowish below; breast brown haired; halteres with black knobs; squamae with a long, dense, white fringe. Abdomen black, the three basal segments and the apical segments with appressed white pile; segments four and five with appressed brown pile; laterally, as far as segment three, the hairs are clear white, from thence to the apex the white hairs are replaced by black tufts; genitalia exerted. Legs brown, the coxae and tarsi blackish; coxae and femora with long pale hairs, which on the middle and more so on the hind femora become very dense and black on the apical third; pulvilli pale.

Wings hyaline, dark brown at the base and along the fore margin to near the apex of the vein  $R_{2+3}$ , the inner border of the colour extends from the base along the lower vein of cell M, thence towards the apex with two conspicuous waves; cell M with a small hyaline area.

Holotype ♂, Brisbane, Q., August 20th, 1918, H. Hacker. Length of body, 10 mm.; of wing, 9 mm. Paratypes: 1 ♂, Brisbane, September 12th, 1927, J.

Mann; 1 ♂, Brisbane, September, G. H. Hardy; 6 ♂, Brisbane, August, 1918, H. Hacker.

The genotype is in the Queensland Museum.

#### Subfamily CYRTOSIINAE.

Eyes with the hind borders entire and without a bisecting line; occiput not inflated, devoid of a bilobation above and a central cavity. Wings with  $R_1$  always missing;  $R_{2+3}$  sometimes missing or, when present, sometimes meeting the vein  $R_1$  well before the wing margin to form an extra subtriangular cell; cell  $mc$  complete, or confluent with cell  $M$ , or entirely wanting;  $M$  with three branches.

This subfamily comprises very few species, all of which are peculiar for their extremely small size and reduced venation. At various times they have been placed by Dipterists in the families Cyrtidae and Empididae and it is only comparatively recently that their position in the Bombyliidae has been assured. They are apparently captured only around flowers, though *Cyrtomorpha paganica* is met with on sand dunes. The species of *Pachyneres* are aberrant among Bombyliids for, whereas all the life histories known show that the larvae are either parasitic or predaceous, *Pachyneres* has been recorded in America as being bred from decaying vegetation. It is highly probable, however, that these Bombyliids are parasitic or predaceous on other insects which breed therein.

Of the six genera which comprise the subfamily, three are represented in the Australian region, viz., *Pachyneres*, *Cyrtosia* and *Cyrtomorpha*, *Cyrtosia* being recorded for the first time. A controversy has recently arisen as to whether Malloch's *P. australis* is indeed a Bombyliid. There seems to be no doubt but that it is, its affinities with the genus *Glabellula* being such that it is only distinguished by the short and broad third antennal segment. *Cyrtosia* bears a great resemblance to *Cyrtomorpha*, the only difference being in the relative lengths of the respective proboscides. White considered that in *Cyrtomorpha* the vein  $R_{2+3}$  was shorter than in *Cyrtosia*, and that whilst in *Cyrtosia* the cell  $R$  was but little longer than the cell  $M$ , in his genus it was much longer. This is true of *Cyrtomorpha paganica*, but in the other species, *flaviscutellaris*, the vein  $R_{2+3}$  is rather long and the cell  $R$  is not much longer than the cell  $M$ .

#### Key to the Genera of the Cyrtosiinae.

1. Proboscis much longer than the head ..... *Cyrtosia* Perris  
 Proboscis not longer than the head ..... 2
2. Cells  $mc$  and  $M$  confluent; vein  $R_{2+3}$  meeting the vein  $R_1$  well before the wing margin to form an extra subtriangular cell; third antennal segment short and broad ..... *Pachyneres* Greene  
 Cell  $mc$  wanting, the cell  $M$  complete; vein  $R_{2+3}$  meeting the wing margin; third antennal segment elongate ..... *Cyrtomorpha* White

#### Genus CYRTOMORPHA White.

*Proc. Roy. Soc. Tasm.*, 1916, 185; Hardy, *ibid.*, 1921, 64.

Genotype, *Cyrtomorpha paganica* White.

Head small, set low down on the thorax; occiput flattened above, little inflated below; ocellar tubercle prominent and placed at the head vertex. Eyes separated in both sexes, but much more so in the female. Frons narrow and elongate in the male; face between upper mouth borders and antennae long and narrow, cheeks much reduced. Antennae not as long as the head, the first segment microscopic,



the second prominent and somewhat cylindrical, the third bulb-shaped, tapering towards the apex and provided with a long slender style of about its own length; proboscis short, not as long as head; palpi very small, one-segmented.

Thorax convex, covered with short, dense, erect hairs; squamae very small and bare. Abdomen short and broad, covered with short, equal and erect hairs. Legs slender, without bristles; pulvilli present. Wings with the cell mc missing and the cell M complete;  $R_{2+3}$  meeting the costa;  $R_5$  meets the margin near the wing apex; cell Cu open.

*Range*.—Australia.

This genus contains two species, one of which is regarded as new. White's species appears confined to Tasmania, whilst *flaviscutellaris* comes from Western Australia.

*Key to the Species of Cyrtomorpha.*

1. Scutellum black;  $R_{2+3}$  short ..... *paganica* White.  
    Scutellum yellow;  $R_{2+3}$  long ..... *flaviscutellaris*, n. sp.

*CYRTOMORPHA FLAVISCUTELLARIS*, n. sp.

♀. Head black; occiput flattened, covered with sparse, erect, black hairs; eyes widely separated; ocellar tubercle black, crowned with erect black hairs; frons broad, concave and black, yellow on each side and close to the antennae, bearing a few black hairs; antennae black, the first and second segments with some short, yellowish hairs.

Thorax black with yellow humeral angles, brownish anteriorly, posteriorly and laterally, the black area reaching forward as a short neck; the black area with numerous short, erect, black hairs, the brown area with similar yellow hairs; pleurae yellowish with sparse yellow hairs; scutellum yellow with sparse yellow hairs; halteres yellow. Abdomen broad and rounded, yellow, the basal segment and the main portion of the second segment black, the whole with numerous short, erect, black hairs. Legs brownish-yellow, covered with pale hairs. Wings hyaline, the inner margin fringed with short cilia;  $R_5$  meets the margin beyond the apex;  $R_{2+3}$  long and almost straight; cell R a little longer than cell M.

Holotype ♀, Swan River, W. Aust., L. J. Newman, November. Length of body, 5 mm.; of wing, 4 mm. Paratype: 1 ♀, also from the Swan River. In the paratype on both wings  $M_1$  is incomplete, not reaching the wing margin.

The holotype is in the Macleay Museum.

*CYRTOMORPHA PAGANICA* White.

White, *Proc. Roy. Soc. Tasm.*, 1916, 186; Hardy, *ibid.*, 1921, 65.

♂. Head with the frons brownish-black, the face yellowish; occiput grey, covered with short, thin, pale pile; face with sparse yellow hairs; beard short, whitish; ocellar tubercle black. Antennae black, the first two segments with short black hairs. Proboscis black and slender, not as long as the head; palpi hidden.

Thorax black, the humeral angles yellow, somewhat brownish laterally and covered with dense, fine, equal and erect, pale yellow hairs; scutellum black, with similar pubescence; pleurae mainly blackish, almost bare; halteres with large yellow knobs; squamae small, pale brownish. Abdomen black, the hind margins of the segments yellow, the yellow bands increasing in size apically, so that the apical segments are mainly yellow, the whole covered with short, yellowish

pile, longest on the sides; venter yellowish with similar tomentum. Legs mainly yellow, the coxae and apical tarsi blackish, the femora brownish at the base and for about one-half their length below; tomentum consisting of pale hairs, longer on the femora; pulvilli pale.

Wings completely hyaline, the veins yellowish; venation normal; cell R longer than cell M;  $R_{2+3}$  short. Length of body, 4.2-4.5 mm.; of wing, 3.8-4.2 mm.

*Hab.*—Tasmania: Hobart (January).

Only three specimens of this species are known, all males, taken at Bellerive, near Hobart, on the 25th January, 1918. They are in the collection of Mr. G. H. Hardy.

#### Genus CYRTOSIA Perris.

Perris, *Ann. Soc. Ent. France*, viii (1 and 2), 1839, 54.

This genus appears identical with *Cyrtomorpha* except for the proboscis, which is longer than the head, slender, porrect, the labella not enlarged, so that it appears of the piercing type met with in the Empididae.

*Range.*—Africa and Australia.

Only one species is known, *parvissima*, which is very small and was taken, whilst sweeping long grass, at Gogango, Central Queensland.

#### CYRTOSIA PARVISSIMA, n. sp.

♂. Head black; occiput flattened, with short black hairs; eyes separated, the frons long and narrow, and narrowing towards the face, shining black, with a distinct median groove and sparse black hairs; face between antennae and oral margin very long and narrow, possessing at about half its length a minute tubercle, which bears some short, appressed, yellow hairs. Proboscis black, very long and slender, much longer than the head; palpi black, minute, with a few short, black hairs; oral opening very small and rounded. Antennae black, the first segment very small, the second prominent, both with small, black hairs, the third bulb-shaped, the style slender, and about as long as the segment.

Thorax black, the humeral angles yellow, the same colour visible on the sides and behind, covered with short pale pile; scutellum black; pleurae blackish-grey, yellow anteriorly, almost bare; halteres yellow. Abdomen black, the apical segments with narrow silver posterior margins, covered with short, erect, black hairs, the silver bands with white hairs. Legs with the coxae and basal two-thirds of the femora black; otherwise yellow, covered with short pale hairs.

Wings hyaline; M with three branches;  $R_{2+3}$  rather long; cell R but little longer than cell M;  $R_2$  meets the wing margin at the apex; cell Cu narrowly open.

Holotype ♂, Gogango, Queensland, 29th March, 1929, A. P. Dodd; allotype ♀, data similar. Length of body: ♂, 1.5 mm., ♀, 2 mm.; of wing: ♂, 1.5 mm., ♀, 1.8 mm.

♀. The female differs from the male in having more widely separated eyes, and the apical segments almost wholly silver, the silver margins of the segments broadening apically.

The holotype and allotype are in the Queensland Museum.

#### Genus PACHYNERES Greene.

Greene, *Proc. Ent. Soc. Wash.*, 26, 1924, 62; Malloch, *Austr. Zool.*, iii, 1924; Hardy, *Ibid.*, iv, Pt. vi, 1927.

Genotype, *Pachyneres crassicornis* Greene.

Head set low down on and closely applied to the thorax; occiput flattened. Eyes separated in both sexes, the frons narrowing towards the antennae. Ocellar tubercle occupying the head vertex. Antennae short, the first segment small, the third short and broad, its length about one and one-half times its width, and in the genotype provided with a terminal and thimble-like style. Proboscis short, not as long as the head; palpi minute.

Thorax convex, covered with hairs only; halteres slender; squamae minute. Abdomen short, clothed with hairs only. Legs slender and without bristles; pulvilli present.

Wings short and stout, the lobe well developed and the alula almost wanting;  $R_{2+3}$  present as a very short vein, upturned to meet the vein  $R_1$  well before the costa, to form an extra subtriangular cell; cells M and mc confluent; cell Cu open.

*Range*.—North America and Australia.

Only one species is present, *australis*, taken at Como, New South Wales.

#### PACHYNERES AUSTRALIS Malloch.

Malloch, *Austr. Zool.*, iii, 1924; Hardy, *Ibid.*, iv, Pt. vi, 1927.

♂. Head black; occiput with short, appressed, pale hairs; eyes separated at the vertex by a little more than the width of the ocellar tubercle, which is black. Frons narrowing towards antennae, at the vertex being about one-third the width of the head; face below antennae about one-half the width of the frons at the vertex. Antennae black, typical, except that the style is wanting, the third segment covered with short, black hairs. Proboscis black, hardly exerted.

Thorax black, the humeral angles and sides yellow, covered with short, erect, pale hairs; scutellum black; pleurae black, the sclerites margined yellow; halteres brownish, the knobs yellow. Abdomen short and rather stout, the segments with a yellowish lateral mark, covered with sparse, pale hairs. Legs black, the apices of femora and bases of tibiae yellowish, covered with short, pale hairs.

Wings hyaline; Sc short, not reaching the costa. Length of body, 1.2 mm.; of wing, 1.3 mm.

*Hab.*—New South Wales: Como (December), Sydney (April).

It is possible that a new genus may be required for Malloch's species. Both the wing figures of Malloch and Greene show the vein Sc to be missing, and Malloch's description of the type species remarks on the absence of the thimble-like style on the third antennal segment. I have not seen the holotype, but an examination of a male, in the collection of the late Dr. Ferguson, shows the vein Sc to be present, though short, and the style to be wanting.

#### Subfamily PHTHIRIINAE.

Hind border of the eyes not indented; eyes without a bisecting line; occiput not bilobate above and devoid of a central cavity; tibiae bare or only pilose, without spicules arranged in rows, but if spicules are present then the palpi are two-segmented; body usually not bristly; cubital fork narrow, if rather broad then the body is narrow and elongate.

According to Bezzi's key to the subfamilies, six genera belong to the Phthiriinae, viz., *Eclimus*, *Marmasoma*, *Geron*, *Acrocotrichus*, *Phthiria* and *Gonarthus*. In his list of the world genera, Bezzi has placed both *Eclimus* and *Marmasoma* in the subfamily Cylleninae, but in neither of these two genera is the occiput bilobate above or with a central cavity. In *Marmasoma* the occiput



is convex, and the only trace of a bilobation is that groove usually met with among the genera of the Bombyliinae. It compares favourably with the African genera *Nomalonia* and *Henica*, but the absence of the central cavity makes it at once distinct. Our species of *Eclimus* I have compared with a specimen of *E. lotus* Will., from America, and I find that generically they are all in complete agreement, and that in *lotus* also there is no bilobation or central cavity. *Marmasoma* and *Eclimus* are alike in having the body long and fairly narrow, the palpi two-segmented and a similar venation. *Marmasoma* can be easily distinguished by the bristly body and two-segmented style, but the two-segmented palpi in conjunction with the bristly legs should make it easy to place in the subfamily key. *Marmasoma* certainly seems to me to have a greater affinity with the Cylleniinae, but to avoid any difficulty in following the key I have placed it here.

*Key to the Genera of the Phthiriinae.*

- |   |                               |
|---|-------------------------------|
| 1. Cell Cu open; palpi two-segmented .....  | 2                             |
| Cell Cu closed; palpi one-segmented .....   | 4                             |
| 2. Body very bristly; style two-segmented .....   | <i>Marmasoma</i> White        |
| Body not very bristly; style one-segmented .....  | 3                             |
| 3. Proboscis short and stout .....  | <i>Gonarthus</i> Bezzi.       |
| Proboscis long and slender .....  | <i>Eclimus</i> Loew.          |
| 4. M with only two branches .....   | <i>Geron</i> Meigen.          |
| M with three branches .....   | 5                             |
| 5. R <sub>4</sub> usually with an appendix; first antennal segment about twice the second; face of male and female with dense pubescence .....                                  | <i>Acreotrichus</i> Macquart. |
| R <sub>4</sub> usually without an appendix; first antennal segment but little longer than the second; face of male only with dense pubescence, that of female almost bare ..... | <i>Phthiria</i> Meigen.       |

The genus *Gonarthus* is recorded from Australia for the first time. It is represented by one species, two specimens taken at Inglewood, Queensland, during September. Neither of these two specimens is in a good enough condition to describe. Bezzi's description of his genus is herewith appended. "This new genus was recently founded by me for my *Dischistus cylindricus*. The genus is distinct owing to its narrow and elongate, cylindrical body, devoid of strong bristles; the moustache is dense and soft; the occipital hairs are long and form a very dense crown. The eyes of the male are coalesced for a considerable distance and have the upper areolets enlarged; the frons of the female is rather narrow. The antennae are long, with the third joint linear and provided with a thin terminal style; the proboscis is rather short, and sometimes exceedingly short and thick; the palps are long, two-jointed, with the apical joint produced outwardly and thus at right angles with the basal one; the metapleura is bare; the legs have bristly hind femora, bristly tibiae and long pulvilli; the wings are short, destitute of a basal hook, comb, and alula. The first vein is straight and the marginal cell not dilated at end; discal cross vein placed on the last third of the discal cell; first posterior cell broadly open." (*Ann. S. Af. Mus.*, xviii, 1921, 88.)

Genus GERON Meigen.

Meigen. *System. Beschreib.*, ii, 1820, 223; White, *Proc. Roy. Soc. Tasm.*, 1916, 186; Hardy, *ibid.*, 1921, 65.

Genotype, *Bombylius hybridus* Mg.

Head about as broad as the thorax; ocellar tubercle rounded, and placed at the head vertex. Eyes in male contiguous, in female separated; frons much

reduced by the contiguous eyes in the male; face slightly projecting between the eyes, extending as a thin strip to the cheeks. Antennae approximate at base, longer than the head, the first segment long and cylindrical, with long hairs, the second short, about one-third the length of the first, the third longer than the first two segments together, spindle-shaped and without any style. Proboscis elongate and slender, much longer than the head; palpi small, one-segmented.

Thorax much arched, bearing long furry and short appressed pile, without any evident bristles; scutellum semicircular in shape, with similar pubescence. Abdomen somewhat conical in shape, decumbent, with dense erect and appressed tomentum and without bristles or bristly hairs. Legs long and slender, the tibiae only with minute spines, more developed on the hind tibiae; pulvilli present.

Wings strong; M with two branches only; cell Cu closed; cell R<sub>5</sub> broadly open.

*Range*.—World-wide.

This genus contains two species, *australis* and *nigralis*, the latter regarded as new. The former species is distributed over practically the whole of the continent and extends to Tasmania, the latter is known only from New South Wales and Queensland.

*Key to the Species of Geron.*

1. Wings with a broad, black, basal pattern, the apical half hyaline .... *nigralis*, n. sp.  
Wings hyaline or smoky with the base and fore margin brown .... *australis* Macq.

*GERON AUSTRALIS* Macquart.

Macquart, *Dipt. Exot.*, ii (1), 1840, 118; Hardy, *Proc. Roy. Soc. Tasm.*, 1921, 65.—*G. dispar* Macquart, *Dipt. Exot.*, suppl. 4, 1850, 122; White, *Proc. Roy. Soc. Tasm.*, 1916, 187.—*G. cothurnatus* Bigot, *Ann. Soc. Ent. France*, (7), lxi, 1892, 374.—*G. hilaris*, White, *Proc. Roy. Soc. Tasm.*, 1916, 188.

♂. Head mainly black; occiput with long, dense, yellow hairs, some long, black hairs adjacent to the hind eye margins; ocellar tubercle black, crowned with long, erect, black hairs. Eyes contiguous from the ocellar tubercle to near the antennal triangle. Frons much reduced by the contiguous eyes, with sparse black hairs and silver-white pile; face grey-dusted; beard short, yellowish, with few black hairs intermixed. Proboscis slender, black, about twice the head length; palpi short, black. Antennae black, of the form described in the generic characters, the first and second segments with long black hairs.

Thorax black with dense yellow erect and appressed golden pile; scutellum black with similar pubescence; pleurae blackish, the mesopleural tuft, long, dense and yellowish; halteres with pale stems, the knobs brown or blackish. Abdomen black with dense, erect, yellow, and appressed golden pubescence, the venter similarly clothed. Legs black, the coxae and femora with yellow hairs, the femora and tibiae with golden scales.

Wings hyaline or smoky, brown at the base and along the fore margin; vein enclosing cell mc apically, waved or straight; venation typical.

♀. Eyes well separated; posterior femora brownish, apex black, middle femora sometimes brownish; fore femora always black; otherwise similar to the male.

Length of body: 3.5–8 mm.; of wing: 3–7.5 mm.

*Hab.*—New South Wales: Linga (October), Glenreagh (January), Kenda (December), Kosciusko (February), Blue Mts. (January–April), Gordon (March),

Sydney (October-March), Ilford (December), Como (December). St. Marys (November), National Park (January-March). Queensland: Townsville (December), Gogango (June), Brisbane (January-March), Chinchilla (November-March), Eidsvold (October-March), Cairns. South Australia: Middleton, Adelaide. Western Australia: Zanthus (September). North Australia: Darwin (October). Tasmania: Hobart (January), Eaglehawk (April), Dunalloy (February), Launceston (March), Geeveston (December), St. Patrick's Rv. (February).

In the series of eighty-seven specimens before me there is a wide range of variation in size and characters, and there do not appear to be any satisfactory characters whereby they may be divided into more than one species. The general pubescence is yellow erect and golden appressed, but in several specimens white hairs have become intermixed, and in sixteen of the series the pubescence is pure white. The wings show varying degrees of coloration, from being hyaline or smoky, brown at the base and along the fore margin, to clear hyaline, the clear wings being usually associated with specimens bearing white pile. White erected hairs on specimens with clear white pubescence, completely hyaline wings, and the outer vein of cell *mc* straight. This latter character is also not constant and there are specimens with yellow hairs and smoky wings with this vein straight.

GERON NIGRALIS, n. sp.

♂. Head black; occiput covered with dense, erect, black hairs; ocellar tubercle black, crowned with long, erect, black hairs. Eyes contiguous as in *australis*. Frons greatly reduced by the contiguous eyes, with sparse black hairs and some silver white tomentum close to the antennae; face black between antennae and upper mouth borders, grey dusted towards the cheeks. Antennae black, segments one and two with stiff black hairs. Proboscis black and slender, about twice the head length; palpi small, black.

Thorax black, with an indistinct long median grey stripe and two short, admedian, similar stripes, covered in front and on the sides with dense, stiff, black hairs, and dorsally with short intermixed black and white tomentum; pleurae black, the mesopleural tuft black; halteres brown, the knobs yellow, black above. Abdomen black, with long dense whitish pile, yellowish at the base, and some intermixed black bristly hairs apically. Legs wholly black, the coxae and femora with black hairs.

Wings with the basal half black, the apical half hyaline, the colour clearing towards the lobe; cell *M* with a small hyaline spot; venation normal.

Holotype ♂, Hornsby, N.S.W., 9th December, 1923. Length of body, 6.5 mm.; of wing, 6 mm. Paratypes: 1 ♂, Sydney, 12th February, 1922, E. W. Ferguson; 1 ♂, Brisbane, December, 1926, G. H. Hardy; 1 ♂, Bunya Mts., Queensland, December, 1926, A. P. Dodd.

Here again a certain amount of variation is evident. The appressed pubescence may be golden or white, *R*<sub>4</sub> may be but gently curved or may embrace the wing tip, and in the male from the Bunya Mts. the black colour of the wings occupies more than the basal half, leaving that portion of the wing including cell *Cu* and the lobe faintly brown.

The holotype is in the Macleay Museum.



## Genus PHTHIRIA Meigen.

Meigen, *Ill. Mag. Ins.*, ii, 1803, 268; Hardy, *Proc. Roy. Soc. Tasm.*, 1921, 66.

Genotype, *Bombylius pulicarius* Mg.

Head in male almost semicircular, in female somewhat pyriform; ocellar tubercle occupying the head vertex. Eyes in male contiguous or subcontiguous, in female widely separated. Frons broad, depressed medianly; face projecting, with dense pubescence in the male, sparse in the female. Antennae approximate at the base, not as long as the head, segments one and two subequal, the third elongate and, when viewed from the side, broadest medianly with the apex deeply concave, provided with a subapical style and usually bearing on its upper surface a number of erect hairs of median length, these hairs more prominent in the male. Proboscis long and slender, longer than the head, the labella not enlarged; palpi consisting of one segment, slender, porrect.

Thorax somewhat oval, longer than broad, slightly arched, with dense pubescence in the male, sparse and appressed in the female; pleurae with sparse hairs except for the dense mesopleural tuft; scutellum large and semicircular. Abdomen composed of seven visible segments, conical and densely pubescent in the male, usually broad and ovate, with the apical segments narrowly pointed and covered with sparse tomentum in the female. Legs slender, devoid of bristles, except for some tiny spicules on the hind tibiae; pulvilli present.

Wings strong;  $R_{2+3}$  and  $R_4$  almost straight; M with three branches; the cubital fork narrow; cell Cu closed; cell  $R_5$  open.

*Range*.—World-wide.

Two species are included, *hilaris* and *albocapitis*, the latter regarded as new. *P. hilaris* is known from every State on the Continent whilst *albocapitis* comes from the north-west of Western Australia.

*Key to the Species of Phthiria.*

1. Face and frons with dense black hairs in the male ..... *hilaris* Walker
- Face and frons with dense white hairs in the male ..... *albocapitis*, n. sp.

## PHTHIRIA HILARIS Walker.

Walker, *Ins. Saund. Dipt.*, 1856, 194; Hardy, *Proc. Roy. Soc. Tasm.*, 1921, 66.—*P. lineifera* Walker, *Trans. Ent. Soc. Lond.*, iv, 1857, 146.—*P. pallipes*, Bigot, *Ann. Soc. Ent. France*, (7), lxi, 1892, 367.

♂. Head black, occiput with dense, equal, yellow hairs; ocellar tubercle black, crowned with erect, black hairs. Eyes contiguous from beneath the ocellar tubercle to near the antennal triangle. Face and frons grey-dusted, covered with dense, long, black pubescence. Antennae black, the first two segments and the third at about its middle, with long black hairs; style spine-like, subapical; beard whitish. Proboscis black, about twice the length of the head; palpi elongate and slender, about one-half the length of the proboscis, with sparse hairs.

Thorax velvety-black, covered with dense, yellow pile; scutellum black, with similar pile; pleurae greyish, the mesopleural tuft yellowish; halteres yellow, the knobs black; squamae blackish with a short, pale fringe. Abdomen black, the segments with yellow lateral margins, covered with long, dense yellow pile; venter mainly yellowish, the apical segments partly black. Legs black, the coxae and femora with long, yellow hairs.

Wings hyaline, the cell Sc yellow; venation typical.

In one male, Brookfield, Q., November, 1926, the yellow lateral margins of the abdomen are so large that the abdomen appears yellow with a row of central black spots and a black apex.

♀. Head mainly yellow, the occiput black with a broad yellow margin adjacent to the hind eye borders; ocellar tubercle black. Eyes separated at the vertex by about twice the width of the ocellar tubercle. Frons yellow, black near antennae, this area extending for about one-third the height and not reaching the eye margins on each side, covered with sparse, black hairs; face broad and yellow, clothed with sparse, short, erect, yellow hairs, which are mainly confined to the mouth borders, extending to the longer and denser, whitish beard below. Antennae black, the hairs on the third segment comparatively few, not so prominent as in the male.

Thorax black, greyish medianly and yellow laterally and posteriorly, the black area being joined to the black suture at the scutellum by a short neck; scutellum yellow, narrowly black at base, the whole with sparse yellow pile; pleurae partly grey and partly yellow with sparse yellowish hairs. Abdomen of the shape described in the generic characters, the basal segment yellow, the second mainly black, the remaining segments yellow with blackish incisions, the whole with sparse yellow pile. Legs yellow, with the coxae, bases of all femora, fore and hind femora above, apices of fore and middle tibiae, hind tibiae and all tarsi, black.

Wings as in male.

Length of body: ♂, 5-8 mm., ♀, 3-9 mm.; of wing: ♂, 4.5-6 mm., ♀, 3.5-8 mm.

*Hab.*—New South Wales: Roseville (October), Warialda (October), Nevertire (October), Blackheath (November), Lindfield (November), Woodford (November), Linga. South Australia: Middleton. Queensland: Westwood (October), Brisbane (October), Eidsvold (November), Brookfield (November). Western Australia: Merredin (August), Zanthus. Victoria: Timboon.

In the series of twenty females under examination there is a tremendous range in variation and it is possible that more than the one species is represented. The frons may be provided with a median black stripe, extending from the ocellar tubercle to the black area near the antennae. The yellow markings of the thorax may be diminished so that eventually only the humeral angles remain yellow. The scutellum may be wholly black. The abdomen may have the middle segments entirely yellow, the other segments as in the description; or it may be all yellow, the second segment with a rather large, median, black spot; or it may be black, the segments with narrow yellow posterior margins. Specimens with this latter character must, I think, represent a distinct species. The legs may have the femora all yellow, black at the bases only, the hind femora at the apex as well, or all femora, except at bases, and tibiae, except at apices, yellow, or as in the description, except that the fore femora may be black with yellow apices.

PHTHIRIA ALBOCAPITIS, n. sp.

♂. Head greyish; occiput covered with dense, white hairs; ocellar tubercle black, crowned with erect, pale hairs. Eyes as in *hilaris*. Frons short and broad, with dense, white hairs, somewhat sparse medianly; face covered with dense white hairs which are continued to the dense beard below. Antennae black, with black hairs, typical. Proboscis very elongate and slender, about three times

the length of the head, black; palpi slender, black, about one-fourth the length of the proboscis, with sparse pale hairs.

Thorax and scutellum black, covered with dense whitish pile; pleurae dark grey, the mesopleural tuft dense, long and whitish; halteres yellow; squamae pale with a sparse, short, white fringe. Abdomen short and broadly conical, black, the segments with grey posterior margins, increasing in size apically, and interrupted medianly, so that the abdomen appears grey, black at the base, with a broad black median stripe, the segments on each side of the stripe partly black; whole covered with dense, long, whitish pile; venter grey, with less dense and more appressed white pubescence.

Fore and middle legs with coxae and femora for two-thirds their length, apices of tibiae and all tarsi, black; apices of femora and remainder of tibiae yellowish; hind legs missing.

Wings hyaline, the cell Sc faintly yellow; r-m placed well beyond the middle of cell mc;  $R_4$  meets the margin at the apex; venation typical.

Holotype ♂, King George's Sound, Western Australia. Length of body, 7.5 mm., of wing, 6.5 mm.

The holotype is unique and is in the Macleay Museum.

#### Genus *ACREOTRICHUS* Macquart.

Macquart, *Dipt. Exot.*, suppl. 4, 1849, 121; Becker, *Ann. Mus. Zool. St. Petersb.*, xvii, 1912, 488; Hardy, *Proc. Roy. Soc. Tasm.*, 1921, 66.

Genotype, *Acreotrichus gibbicornis* Macquart.

Head semicircular in shape, about as broad as the thorax; occiput flattened, covered with dense pile. Eyes contiguous in the male, separated in the female. Face and frons broad, with dense erect hairs, the face projecting between the eyes, cushion-like laterally. Ocellar tubercle rounded and prominent, placed at the head vertex. Antennae approximate at base, porrect, not as long as the head, the first segment about twice the length of the second, both with long stiff hairs, the third longer than the first and second together, outwardly directed and, when viewed from the side, broadest medianly, the apex deeply concave, the concavity with a small, spine-like subapical style; gibbose and bearing about six to eight very long hairs at and above its broadest point. Proboscis long and slender, the labella not enlarged, much longer than the head; palpi slender, porrect, one-segmented, and a little less than half the length of the proboscis.

Thorax longer than broad, little arched, covered with long dense hairs in the male, less dense in the female; prealar bristles more prominent in the female; scutellum large and semicircular with similar pubescence; pleurae with a dense, mesopleural tuft. Abdomen consisting of seven visible segments, conical and densely pubescent in the male, broadly oval and much less pubescent in the female; no evident bristles. Legs slender, the tibiae with spicules, more developed on the hind tibiae; pulvilli present.

Wings strong;  $R_{2+3}$  and  $R_4$  almost straight, the latter vein usually with a short backwardly-directed appendix; M with three branches; cell Cu closed; lobe and alula well developed.

*Range*.—North America and Australia.

This genus was erected by Macquart for the solitary species *gibbicornis* which, like *Phthiria hilaris* Walk., is remarkable in that the female differs so



much from the male that they were originally described as two distinct species. *Acreotrichus gibbicornis* is known from New South Wales, Queensland and Western Australia.

ACREOTRICHUS GIBBICORNIS Macquart.

Macquart, *Dipt. Exot.*, suppl. 4, 1849, 121; Schiner, *Reise Novara*, 1868, 138; Froggatt, *Austr. Insects*, 1907, 297; Becker, *Ann. Mus. Zool. St. Petersb.*, xvii, 1912, 488; Hardy, *Proc. Roy. Soc. Tasm.*, 1921, 66.—*Acreotrichus fuscicornis* Macquart, *Dipt. Exot.*, suppl. 4, 1849, 122; Froggatt, *Austr. Insects*, 1907, 297; Hardy, *Proc. Roy. Soc. Tasm.*, 1921, 66.—*A. inappendiculatus* Bigot, *Ann. Soc. Ent. France*, (7), lxi, 1892, 366.

♂. Head dark; occiput covered with dense, white to pale brownish hairs, with some longer black hairs adjacent to the hind eye-margins; ocellar tubercle black, with a number of long, erect, black hairs. Eyes contiguous or almost so for about one-third the frons. Frons and face broad, clothed with dense, erect, white hairs and longer encircling black hairs, the white hairs extending from the frons to the dense beard below, the frons also with silvery-white appressed tomentum above. Antennae of the form described in the generic characters, the hairs on the segments being black, those on the third segment very long; style subapical, spine-like. Proboscis black and slender, about twice the length of the head, the labella not enlarged and usually upraised; palpi black, about a little less than half the length of the proboscis.

Thorax black, covered with dense, long, whitish hairs, the pleurae, breast and scutellum with similar pubescence, the mesopleural tuft dense and long; the dorsum with few black bristly hairs intermixed; halteres brownish, the knobs black. Abdomen black, clothed above and on the sides with dense, long, whitish hairs, with some intermixed, longer, bristly hairs, especially towards the apex; venter with less dense pubescence. Legs blackish, the coxae and femora with long white hairs; the femora and tibiae with whitish scales.

Wings light smoky, the base and fore margin to about the apex of the vein Sc yellowish, the colour diffusing inwardly;  $R_1$  usually with an appendix; venation normal.

♀. Occiput black with a yellow border adjacent to the hind eye-margins, the pubescence shorter and less dense than in the male. Eyes separated at the head vertex by about two and one-half times the width of the ocellar tubercle. Frons black, the antennal tubercle somewhat yellowish, with short black hairs; face yellow to grey, with similar but less dense pubescence to that in the male.

Scutellum yellow-margined, the pale prealar bristles visible. Abdomen black, the segments with brownish posterior borders, the pubescence limited to white and yellow, appressed pile and sparse, long, white hairs, more prominent laterally. Legs black, the knees of the fore and middle tibiae, brown.

Length of body, 4–8 mm.; of wing, 3–6 mm.

*Hab.*—New South Wales: National Park (August), Sydney (September), Myall Lakes (September), Gordon (March), Woy Woy (September), Guildford (September), French's Forest (September) and Hawkesbury River. Queensland: Gayndah (August), Eidsvold (August), Inglewood (September). Western Australia: Eradu (September), Perth (October), Tammin (August).

Included in the series of this species are seven specimens (5 ♂, 2 ♀) from Western Australia, which possess spotted wings, but differ in no other way from

*gibbicornis*. In two of these, the spots are but faintly discernible and I prefer to regard them as a variety, rather than as a distinct species.

#### Genus ECLIMUS Loew.

Loew, *Stett. Ent. Zeit.*, v, 1844, 154; Hardy, *Proc. Roy. Soc. Tasm.*, 1921, 63.

Head about as broad as thorax; occiput inflated, but not much so. Eyes usually contiguous in the male, separated in the female, their upper facets enlarged. Ocellar tubercle rounded and prominent and placed at the head vertex. Frons small; face much projecting between the eyes, the cheeks narrow. Oral opening containing a large rounded tubercle, which bears a sparse moustache. Antennae approximate at base, about as long as the head; first segment long and cylindrical, the second short, the third about as long as the first and second together, somewhat elongate-conical in shape, with or without a very minute terminal style. Proboscis long and slender, the labella little enlarged; palpi two-segmented, the first segment ribbon-shaped, the second somewhat lanceolate and about one-half to one-third the length of the first.

Thorax convex, muricate in the males only, the bristles weak, covered with depressed tomentum and sparse erect hairs; scutellum semicircular in shape, with thin, marginal bristles; squamae small, with a sparse fringe; halteres long and slender. Abdomen long and slender, decumbent, and composed of eight visible segments in the male, the ninth with the genitalia, and seven in the female, the eighth with the genitalia; tomentum consisting of depressed and erect pile, sometimes tuft-like apically. Legs long and slender, the hind pair especially so; spines on the tibiae small and weak; pulvilli present, weak.

Wings always with a diminished alula and sometimes with the lobe partly cut away; costa denticulate in the males only, smooth in the females; M with three branches; cells  $R_3$  and  $R_1$  undivided; cell mc long and narrow, sometimes angulated below;  $R_{2+3}$  gently curved at the apex, never looped; cells  $R_5$  and Cu open;  $Cu_2$  incomplete;  $R_4$  S-shaped.

*Range*.—Europe, North America and Australia.

This genus comprises three species, two of which are regarded as new. Sexual dimorphism is here well illustrated. In the male the thorax is muricate, the costa denticulate, and the abdomen consists of nine segments, whilst in the female both the thorax and costa are smooth and the abdomen consists of eight segments. In one species, *nigrapicalis*, a further difference in the sexes is shown by the coloured wing of the male and the hyaline wing of the female.

*Distribution*.—As yet the only species that does not appear confined to Queensland is Hardy's *longipalpis*, the type of which was described from Botany Bay, New South Wales.

#### Key to the Species of Eclimus.

1. Wing darkened along the costal border to the apex ..... *furvicostatus*, n. sp.  
Wings not as above ..... 2
2. Small species, the female with similar wing markings to the male, these markings consisting of a large blotch extending from the apex to about one-third the costal border, and a small blotch near the base of the vein  $R_{2+3}$  .... *longipalpis* Hardy.  
Large species, the male with a single blotch in the wing, the female with clear wings ..... *nigrapicalis*, n. sp.

#### ECLIMUS NIGRAPICALIS, n. sp.

♂. Head grey; occiput covered with erect white hairs, which conceal two rows of short black bristles, with another row of bristles close to the eye-margins;

ocellar tubercle black with some long, erect, black hairs. Eyes approximate, being separated at the narrowest point by a distance equal in width to the fore ocellus. Frons greyish, small; face with white hairs on either side and some sparse black hairs between the mouth borders and antennae; oral tubercle with a moustache of long white hairs. Antennae black, the first two segments grey-dusted, with short black hairs, the third with a microscopic apical spine. Proboscis black, about twice the head length; palpi black, not quite half as long as the proboscis.

Thorax dark brownish, grey laterally and with two admedian grey stripes; mesonotum definitely muricate, especially along the grey stripes, the whole bearing depressed white pile and some sparse intermixed black and white hairs; bristles pale brownish; scutellum dark greyish, with appressed grey pile and thin, black, marginal bristles; pleurae and breast grey, sparsely white haired; squamae brownish with a thin white fringe; halteres pale brown with black knobs. Abdomen black, covered with appressed black pile, the incisions with narrow bands of white pile, the black pubescence becoming longer and denser towards the apex; the seventh segment with white pile; laterally there are clear white hairs extending to the fifth segment, the apical segments being covered with dense black hairs, which have the appearance of tufts; the eighth segment bears some long, dense, silver-white hairs; venter grey, with white hairs, apically black-haired. Legs black, the coxae grey with white hairs, the femora with appressed white pile; spines weak and black; pulvilli pale.

Wings hyaline with a single large fuscous blotch placed at about two-thirds the length of the costal border and extending to r-m, its outlines much suffused; venation typical.

♀. The female differs from the male in having completely hyaline wings and in having the eighth segment devoid of the silver hairs found in the male.

Holotype ♂, Goondiwindi, Queensland, 29th December, 1927, F. Roberts; allotype ♀, similar data. Length of body: ♂, 12 mm.; ♀, 10 mm.; of wing: ♂, 9 mm.; ♀ 7.5 mm. Paratypes: 6 ♂, Goondiwindi, December and January, 1927, F. Roberts; 6 ♂, Goondiwindi, G. R. Bassingthwaighe; 1 ♂, Eidsvold, Baneroff (no date); 1 ♂, Rockhampton (no date). Other specimens in the series examined were captured at Westwood and Chinchilla, Queensland, in November and February.

All the specimens from Goondiwindi were taken in the one spot, hovering over a decaying log. The difference in the wings of the male and female is remarkable and, although no pairs were captured *in cop.*, I do not think that there is any doubt as to the sexes, as they were all taken at the same time and in the same place and no males are known with a completely hyaline wing and no females with a darkened wing. The blotch in the wing of the male does, however, vary in intensity and in the specimens from Eidsvold and Rockhampton it is very faint.

The holotype and allotype are in the Queensland Museum.

#### ECLIMUS LONGIPALPIS Hardy.

Hardy, *Proc. Roy. Soc. Tasm.*, 1921, 63.

♂. Head grey; occiput covered with white hairs; ocellar tubercle black with a few erect black hairs. Eyes contiguous near the ocellar tubercle. Face much projecting between the eyes, almost bare, the beard being white; oral tubercle with a moustache of white hairs. Antennae with the first two segments grey-



dusted, the third normal, i.e., about as long as the first and second segments together, rather stout, broader than the second segment and with what appears to be an extremely minute apical spine. Proboscis black, about twice the length of the head; palpi black, about one-half the length of the proboscis.

Thorax black, covered with appressed black and golden pile, the latter more or less confined to the middle line; pleurae and breast grey with white hairs, more abundant on the mesopleurae; scutellum black, margined grey, the grey being continued laterally to the humeral callus; bristles thin, pale; squamae with a sparse white fringe; halteres brownish. Abdomen black, covered with black tomentum, the incisions with white pile; from the third segment the black pile becomes bristle-like and on the apical segments it is longer and more erect; venter grey, white tomentose, except towards the apex. Legs with the coxae grey, otherwise black, covered with white tomentum, the coxae and femora with white hairs.

Wings hyaline, with a small fuscous blotch at the base of the vein  $R_{2+3}$  and another larger blotch at the apex, the latter bounded by the vein  $R_4$  and the veins at the bases of the cells  $M_1$  and 2nd  $M_2$ , from the latter reaching the costa in an almost straight line; venation normal.

♀. Similar to the male, except for the usual sexual differences.

Allotype ♀, Westwood, Queensland, November, 1927, A. P. Dodd. Length of body, 5.5 mm.; of wing, 4.5 mm.

The species was described by Hardy from a single male specimen, which he made the holotype.

*Hab.*—New South Wales: Botany Bay. Queensland: Westwood (November), Chinchilla (April).

Hardy was correct in assuming that the third antennal segment of his holotype was abortive. In his description of the species he says "third joint scarcely longer than the second, the apex is truncate, receding from the dorsal to the ventral surface, and the edge appears to be crowned with minute spines". The third antennal segment of the three specimens (1 ♂, 2 ♀) before me is normal in every way.

The allotype is in the Australian Museum.

#### *ECIMUS FURVICOSTATUS*, n. sp.

♂. Head grey; occiput covered with short, erect, white hairs, which are extended to the chin to form a sparse beard. Eyes contiguous for a short distance below the ocellar tubercle; frons small, apparently bare; face with a few short black hairs; oral tubercle with a moustache of white hairs. Antennae not as long as the head, the first two segments grey-dusted and covered with short, appressed, black hairs, the third black and provided with a microscopical spine. Proboscis black and slender, about twice the head length; palpi black, not quite half the length of the proboscis.

Thorax dark brown, grey laterally and posteriorly, clothed with appressed black and white tomentum and sparse hairs; prealar bristles brown; scutellum grey-margined, with similar tomentum and thin, pale, marginal bristles; pleurae and breast grey with sparse white hairs; halteres pale brown with blackish knobs; squamae brown with a sparse white fringe. Abdomen black, clothed with appressed black pile, the incisions of segments one to five with grey pile, which is also prominent on the sides, intermixed with erect white hairs; apical segments

apparently with black tomentum only; venter with grey pile. Legs with grey coxae, the fore femora and all tarsi black, the remainder somewhat brownish; tomentum consisting of white hairs and greyish pile; pulvilli weak, pale.

Wings hyaline, the fore margin to the apex brown, the colour expanding from the almost hyaline base to the cross-vein r-m. being bounded by the vein  $R_4$ , and leaving a large hyaline area which extends from r-m to near the base of the vein  $R_4$ ; cell mc very long and narrow, somewhat angulated below.

Holotype ♂, Westwood, Queensland, November, 1927, A. P. Dodd; allotype ♀, Stanthorpe, Queensland, 27th January, 1927. Length of body: ♂, 13 mm., ♀, 12 mm.; of wing: ♂, 10.5 mm., ♀, 9.5 mm. Paratype: 1 ♂, as with allotype.

The holotype and allotype are in the Queensland Museum.

#### Genus MARMASOMA White.

White, *Proc. Roy. Soc. Tasm.*, 1916, 188; Hardy, *ibid.*, 1921, 63.

Genotype, *M. sumptuosa* White, by original designation.

Head somewhat globular in shape, almost equal in breadth to the thorax; occiput inflated, with long hairs and short bristles; ocellar tubercle prominent and placed at the head vertex. Eyes large, contiguous in the male, separated in the female; frontal triangle rather long but narrow; proboscis longer than the head, slender; palpi slender, two-segmented. Antennae longer than the head, approximate at the base, the first segment long and cylindrical, the second short, about one-third the length of the first, the third constricted at the base, very slightly expanded, almost as long as the first two segments together and provided with a slender two-segmented style of about one-third its length.

Thorax convex, bearing numerous long bristles and clothed with scales and long bristly hairs; scutellum semicircular in shape, also with long bristles. Abdomen in male of an elongate-conical shape with an upraised apex, composed of nine visible segments; in the female broadest medianly and apically pointed; tomentum consisting of scales and long hairs. Legs long and slender, the posterior femora with many, middle femora with few stout spines beneath; tibiae with numerous stout spines, more developed on the hind tibiae; tarsi long, the joints marked by spurs; pulvilli present, weak.

Wings with the lobe somewhat diminished and the alula rather small;  $R_{2+3}$  but gently curved at the apex; cell mc somewhat angulated below, the angle frequently marked by a recurrent veinlet; cell  $R_3$  open; cells  $R_3$  and  $R_4$  without interradianals; cell M much longer than cell R.

*Range*.—Australia.

*Marmasoma* is represented by a solitary species, *sumptuosa*, which is recorded from Tasmania and mountainous portions of South-Eastern Australia.

#### MARMASOMA SUMPTUOSA White.

White, *Proc. Roy. Soc. Tasm.*, 1916, 190; Hardy, *ibid.*, 1921, 63.

♂. Head mainly greyish; occiput darker above, clothed with brownish scales, very dense at the hind eye-margins, and long, dense, light brown hairs, with a row of short, strong, black bristles above. Eyes contiguous from below the ocellar tubercle to near the antennal triangle; frontal triangle with dense, pale scales; face rather narrow, covered with pale scales and hairs; chin with a thin whitish beard; mouth opening rather broad, the cheeks much reduced. Antennae black, the first segment with long pale and short black hairs, the third segment bare with

a distinctly two-segmented style. Proboscis black, about one and one-half times the head length; palpi brownish, about one-fourth the length of the proboscis.

Thorax blackish, with two admedian greyish stripes and greyish margins, the black area appearing clothed with appressed yellow scales, the grey with whitish scales, the whole with sparse, short, whitish hairs, densest laterally; prothoracic spines strong and brown, remaining spines and bristly hairs, black; scutellum with median, dense golden or brownish scales, marginal white scales and hairs and well developed, black, marginal bristles; pleurae greyish, the sutures somewhat depressed, with sparse white scales and hairs; halteres with brownish knobs; squamae pale with long, sparse, whitish hairs. Abdomen of a dark brown ground-colour, clothed with dense, brownish scales, the incisions with narrow bands of white pile; a row of dark brown centre spots present, the whole with scattered black hairs, the first segment only with white hairs. Legs with the elongate coxae light brown, the femora black, the tibiae brownish, the tarsi darker, clothed with brownish scales; spines black; pulvilli pale.

Wings hyaline, the costal cell yellowish, the costal margin otherwise brownish, the colour being dilated from the base to reach r-m, where it is concentrated into a large rounded spot; hyaline area with dark brown spots on the angulated portion of cell mc, at the apex of cell M, near the apex of vein  $R_{2+3}$ , and two on  $R_4$ .

♀. Similar to the male except for the generic differences of the eyes and abdomen; the frons with numerous long curved bristles.

Length of body, 8.5–11 mm.; of wing, 7–9.5 mm.

*Hab.*—Tasmania: Hobart, Bagdad (November), Tyenna (December). New South Wales: National Park, Mt. Kosciusko (November).

#### Subfamily USIINAE.

Eyes with the hind borders entire, the occiput devoid of a bilobation and a central cavity; tibiae usually not bristly, but if bristles are present, then the palpi are two-segmented. Cubital fork broad; if it is rather narrow then the body is short and broad.

This subfamily was overlooked in my general notes on the Bombyliidae and has been omitted from the subfamily key. The Usiinae are placed next to the Phthiriinae, from which they may usually be distinguished by the broad cubital fork. Thus out of the thirteen subfamilies recognized by Bezzi the Australian region contains ten.

Only one genus is included, *Eusurbus*, which is new and is erected for Macquart's *Bombylius crassilabris*. This species, although it resembles the species of *Dischistus* in its bristly body and venation, is distinct from the Bombyliinae on account of its two-segmented palpi.

Both species are readily attracted by flowers, but beyond this nothing is known of the adult habits or life histories.

#### Genus EUSURBUS, n. gen.

Genotype, *Bombylius crassilabris* Macq.

Head broad and semicircular; occiput moderately convex, covered with dense hairs and intermixed bristles. Eyes reaching the full height of the head, somewhat narrow, contiguous or subcontiguous in the male, separated in the female; ocellar tubercle very large, rounded, occupying the head vertex. Frons concave, the antennal tubercle separated by a distinct groove; face projecting between



the eyes, covered with a dense brush of hairs, the antennae placed on its upper and outer edge; oral opening large and broad, its borders raised and separated from the face by deep grooves. Antennae approximate at the base, about as long as the head; first segment long and cylindrical, second short, about one-third the length of the first, the third as long as the first and second together, sometimes longer, constricted at the base, apically pointed, the style spine-like, apical or subapical. Proboscis longer than the head, somewhat stout, the labella much enlarged; palpi short and curled, two-segmented, the second segment about one-fourth the length of the first.

Thorax broad, flattened or slightly humped, covered with dense erect and appressed pubescence, the bristles small but distinct; pleurae and breast densely haired; scutellum rather small; halteres small; squamae with a long and dense fringe. Abdomen broad and rounded, consisting of seven visible segments, the eighth with the genitalia, covered with dense erect and appressed pile with long bristly hairs intermixed. Legs slender, the tibiae bristly, the middle and hind femora sometimes with short spines below; pulvilli present.

Wings strong; M with three branches;  $R_{2+3}$  curved at the apex, sometimes looped; cell mc acute at base, broad and rather short; cross-vein r-m placed well below its middle, so that cell  $R_5$  is short; cells  $R_5$  and Cu open, the latter sometimes narrowly so.

This genus is represented by two species, the genotype and *nigracinctus* which is recorded as new. This black banded species is known from Western Australia only, whilst *crassilabris* comes from New South Wales and Queensland, its record from Western Australia being rather doubtful.

*Key to the Species of Eusurbus.*

1. Body covered with brownish pubescence; legs brownish ..... *crassilabris* Macquart.  
     Body covered with grey and black pubescence, forming bands on the abdomen; legs  
     black ..... *nigracinctus*, n. sp.

*EUSURBUS NIGRACINCTUS*, n. sp.

♂. Head dark; occiput covered with dense, equal and erect, whitish hairs, with many black bristles intermixed; ocellar tubercle black, crowned with erect black hairs. Eyes contiguous for some distance below the ocellar triangle. Frons broad with grey pile; face very broad, with long, erect, black hairs and shorter white pile, the latter confined to that portion of the face between the upper mouth borders and antennae and continued around the mouth borders themselves, the former encircling the white hairs. Antennae with the first two segments grey-dusted and bearing black hairs, longer beneath, intermixed with short white hairs, the third segment as long as the first two together and provided with a distinct style placed on the apex. Proboscis black, somewhat longer than the head, the labella much enlarged; palpi black, with long hairs below and at the apex.

Thorax black, about as broad as long, covered with grey appressed and intermixed grey and black, short, erect pile; bristles short and black; pleurae and breast with dense black and intermixed grey hairs; scutellum brownish with grey tomentum and long, thin, black, marginal bristles; squamae with a dense, long, yellowish fringe; halteres small, obscure yellow. Abdomen very broad, covered with dense, black and grey pubescence, with many intermixed black, bristly hairs; the black hairs are arranged as narrow bands, the apical one short and not reaching the sides; laterally with clear white pile basally, the remaining

segments with dense, black and grey tufts, which are a continuation of the grey and black dorsal bands; apical segments mainly with grey hairs, black tufted laterally; venter mainly grey tomentose, the apical segments black tomentose. Legs black, the coxae and femora white haired, the femora and tibiae with grey appressed pile; middle and hind femora with few and many black spines below. Wings hyaline, brownish at the base and for a short distance along the fore margin;  $R_{2+3}$  curved but not looped; basal vein of cell  $M_1$  very small; cell Cu narrowly open.

♀. Eyes separated at the vertex by about twice the width of the ocellar tubercle, the broad frons with grey and black hairs.

Holotype ♂, Wyalkatchem, W. Aust., 1st September, 1926, E. W. Ferguson; allotype ♀, Eradu, W. Aust., 8th September, 1926, A. J. Nicholson. Length of body: ♂, 13 mm.; ♀, 13 mm.; of wing: ♂, 12 mm.; ♀, 12 mm. Paratypes: 1 ♂, Wyalkatchem, W. Aust., 30th August, 1926, A. J. Nicholson; 3 ♂, 2 ♀, Kojarena, W. Aust., September, 1926, A. J. Nicholson; 4 ♂, 5 ♀, Kojarena, September, 1926, E. W. Ferguson; 1 ♂, 1 ♀, Merredin and Moora, W. Aust., L. J. Newman. There is another ♀, captured by E. W. Ferguson at Canna, W. Aust., during September.

In many specimens the black hairs predominate on the thorax, in others the white hairs are more distinct. In the latter case, the white hairs are dense over the pleurae and breast and descend over the wing base to the sides of the first abdominal segment.

The holotype and allotype are in the Macleay Museum.

#### EUSUREUS CRASSILABRIS Macquart.

*Bombylius crassilabris* Macquart, *Dipt. Exot.*, suppl. 5, 1854, 77.—*Dischistus crassilabris* Schiner, *Reise Novara*, 1868, 138; Hardy, *Proc. Roy. Soc. Tasm.*, 1921, 68.

♂. Head greyish; occiput moderately convex, covered with dense, erect brownish hairs, with many brown and black bristles intermixed, the tomentum near the eye-margins being also golden and appressed. Eyes approximate for a short distance below the ocellar triangle, the upper and inner facets enlarged; ocellar tubercle large, black, with black hairs, those in front being very long and directed forward. Frons with a faint median groove, with appressed golden tomentum and black hairs; face very broad, with short brown hairs, longer above, and numerous long, erect, black hairs close to the inner eye-margins and continued almost to the whitish beard below. Proboscis rather stout, rarely fully exerted, but when so, about twice the head length, the labella much enlarged; palpi short, black, with sparse long hairs at the apex and below. Antennae with the first two segments grey-dusted and bearing short black hairs above and long brownish hairs below, the third segment black, much longer than the first two segments together, with a minute, subapical, spine-like style.

Thorax black, moderately humped, covered with dense, short, pale and intermixed hairs which, viewed from above, have an almost whitish appearance laterally and, when viewed from the front, the whole has a whitish sheen; appressed golden tomentum also present; bristles short, reddish; scutellum brownish with similar pubescence to the thorax, the marginal bristles thin and reddish; pleurae and breast densely white-haired, the breast and mesopleural tuft with intermixed reddish hairs; halteres with yellowish knobs, black above; squamae with a long, dense, pale fringe. Abdomen very broad, but usually longer

than broad, covered with appressed golden tomentum and long brownish hairs, densest on the sides, with numerous longer, black, bristly hairs intermixed; venter mainly white-haired with intermixed pale bristly hairs. Legs with the coxae and femora at the base black; femora brownish or reddish; tibiae and tarsi darker; coxae and femora with white hairs, tibiae and femora with white appressed tomentum.

Wings subhyaline, brown at the base and along the fore margin;  $R_1$  meets the costa close to  $Sc$ ;  $R_{3+4}$  is looped apically, the loop being longer than deep, the ascending arm straight, the base of the loop sometimes with a small appendix;  $R_4$  sometimes with a small appendix placed on its first crest; alula rather small.

♀. Similar to the male except for the broadly separated eyes, the frons bearing golden tomentum, white near the antennae, and black hairs.

Length of body, 9–13 mm.; of wing, 8.5–12 mm.

*Hab.*—New South Wales: Guildford (October), National Park (July), Lindfield (September), Sydney, Toronto, Ballina. Queensland: Brisbane (September), Chinchilla (September).

Among the many specimens examined are two males from Perth, W. Aust., in which the pubescence is much lighter, almost golden, and the fore and middle femora are black with short black spines beneath. In none of the specimens from New South Wales and Queensland are the femora black or possessing spines beneath. I am inclined to think that these two Bombyliids represent Walker's *altus*, but refrain from a determination until more specimens are available.

The genotype has been deposited in the Queensland Museum.